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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/755,131	01/08/2001	Amir Globerson	GLOBERSON1	4976

7590 04/07/2004

BROWDY AND NEIMARK, P.L.L.C.
624 Ninth Street, N.W.
Washington, DC 20001

EXAMINER	
HARPER, V PAUL	
ART UNIT	**PAPER NUMBER**
2654	

DATE MAILED: 04/07/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/755,131	GLOBERSON, AMIR	
	Examiner	Art Unit	
	V. Paul Harper	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-6 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-6 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 10/3/01.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The Examiner has considered the references listed in the Information Disclosure Statement dated 10/2/01. A copy of the Information Disclosure Statement is attached to this office action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhao et al. ("Improvement of LPC Analysis of Speech by Noise Compensation" Trans. of the IEICE A Vol. J81-A, No. 11, pp. 1538-1591, Nov. 1998), hereinafter referred to as Zhao (n.b. page numbers refer to the translation).

Regarding claim 1, Zhao teaches an improved LPC analysis technque for noise reduction. Zhao's method includes the steps of:

- processing a compressed digital signal representative of the voice signal including a speech component and a noise component (p. 3, §2, the result of the LPC

analysis of *w(n)*, which includes speech and noise and is processed to remove noise, where LPC is a compressed format and the parameter *n* implies a digital signal);

- determining the noise component to be subtracted from the compressed digital signal (p. 3, §2.1, equ. 4 subtracts noise component, §2.1 (i) estimates noise).

Regarding claim 2, Zhao teaches everything claimed, as applied above (see claim 1); in addition, Zhao teaches "said compressed digital signal is based on a set of linear prediction coding (LPC) coefficients analysis and a residual signal, and is obtained by applying an LPC analysis to the voice signal" (Outline, p. 1, and p. 3, §2. LPC analysis for *x(n)* that includes a speech signal).

Regarding claim 3, Zhao teaches everything claimed, as applied above (see claim 2); in addition, Zhao teaches:

- determining a power spectrum of the noise component of said compressed digital signal during a non-speech activity, and calculating its average value (§2.1 when performing a spectrum estimation the power of the noise is estimated (i) and is necessarily an average of the interval under analysis);
- calculating a power spectrum estimator of the compressed digital signal with a reduced noise component (§2.1, result of the operations in a spectral estimation with reduced noise);
- determining an autocorrelation function of the compressed digital signal with the reduced noise component (§2.1, (iv));

- determining a set of modified LPC coefficients from the autocorrelation function (§2.1, p. 4, (v) predictive coefficients are found).

Regarding claim 4, this claim includes limitations that are similar to those in claims 1-3 and is rejected for the same reasons.

3. Claim 5 is rejected under 35 U.S.C. 102(b) as being anticipated by Kimura ("Advances in Speech Recognition Technologies," Fujitsu Sci. Tech. J., 35, 2, pp. 202-211, Dec. 1999), hereinafter referred to as Kimura.

Regarding claim 5, Kimura teaches techniques used with speech recognition systems (i.e., a voice processing unit) and includes the following:

- the voice processing unit comprising a noise reduction utility interconnected between a voice coding utility and a voice recognition utility (p. 208, Fig. 9, item (d) spectrum analysis is a form of voice coding; also see p. 203, col. 1, LPC is a form of spectral analysis; §4.3 (b), spectrum subtraction is performed after coding and before recognition),
- the noise reduction utility being operable for processing a compressed digital signal representative of an input voice signal received from the voice coding utility (§4.3 (b) spectral subtraction at point (b) in Fig. 9),
- generating an output compressed digital signal with reduced noise spectrum (Fig. 9, the noise-reduced signal is sent to the matching stage).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hershkovits et al. (U.S. Patent 6,003,004), hereinafter referred to as Hershkovits, in view of Kimura.

Regarding claim 6, Hershkovits discloses a speech recognition system using compressed speech data. Hershkovits' system consists of:

- an input port for receiving an input voice signal (Fig. 5, item 10, a microphone),
- an analog-to-digital converter for processing the input signal to generate a digital output indicative thereof (Fig. 5, item 14, an A/D converter),
- a voice processing utility for processing the digital signal and generating a compressed digital signal representative of the input voice signal (Fig. 5, item 16, a vocoder).

Hershkovits' system also includes a recognizer (Fig. 5, item 50) and an operating system (Fig. 5, item 18—controller, system interface, responsive to commands from the recognizer) and a vocoder (Fig. 5, item 16—voice processing unit), but Hershkovits

does not specifically disclose an interconnected voice processing unit comprising: "a noise reduction utility coupled to the voice processing utility for processing said compressed digital signal, and generating an output compressed digital signal with reduced noise spectrum; and a voice recognition utility coupled to the noise reduction utility for processing said output compressed digital signal with reduced noise spectrum." However, the examiner contends that this concept was well known in the art, as taught by Kimura.

In the same field of endeavor, Kimura teaches speech recognition technologies that includes noise reduction processing of coded speech signals before matching the speech with a recognizer (§4.3 (b) spectral subtraction at point (b) in Fig. 9 where the noise-reduced signal is then sent to the matching stage—the recognizer).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hershkovits by specifically providing the noise reducing elements, as taught by Kimura, since such noise processing improves the accuracy of the recognition (Kimura, p. 207, §4.1).

Conclusion

Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

or faxed to:

(703) 872-9314

Hand-delivered responses should be brought to:

Crystal Park II
2121 Crystal Drive
Arlington, VA.
Sixth Floor (Receptionist)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. V. Paul Harper whose telephone number is (703) 305-4197. The examiner can normally be reached on Monday through Friday from 8:00 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil, can be reached on (703) 305-9645. The fax phone number for the Technology Center 2600 is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service office whose telephone number is (703) 306-0377.

V. Paul Harper

VPH/vph
March 30, 2004

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER